

(No Model.)

J. MÄHLMANN.  
PYROTECHNIC CARTRIDGE.

No. 552,188.

Patented Dec. 31, 1895.

Fig. 1

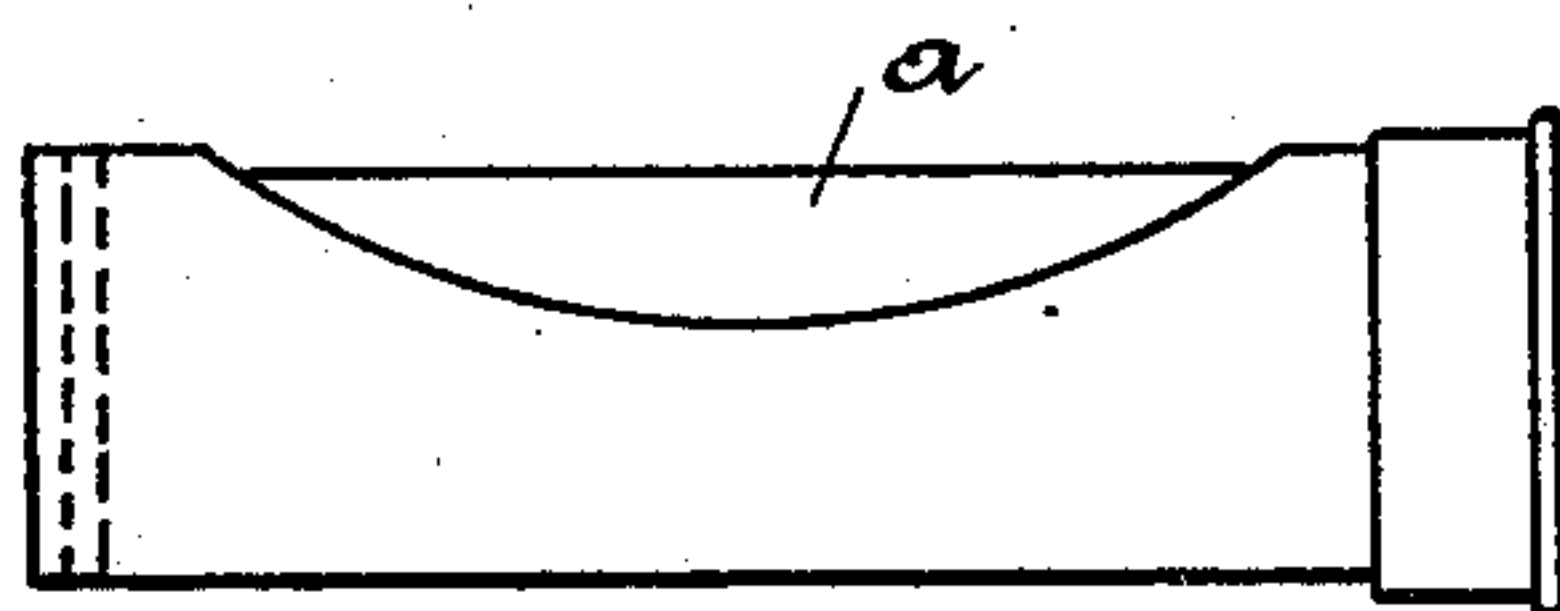
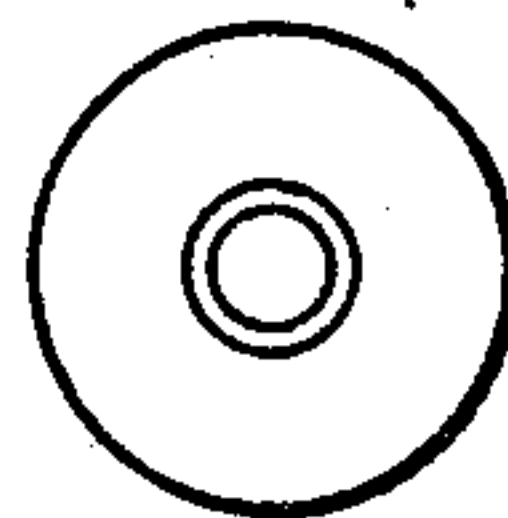


Fig. 2



Witnesses:  
E. H. Kunk  
J. P. Wether

Inventor  
Jürgen Mählmann  
by his attorneys:  
Dr. J. Schanz & Co

# UNITED STATES PATENT OFFICE.

JÜRGEN MÄHLMANN, OF ALTONA, GERMANY.

## PYROTECHNIC CARTRIDGE.

SPECIFICATION forming part of Letters Patent No. 552,188, dated December 31, 1895.

Application filed April 12, 1894. Serial No. 507,291. (No model.) Patented in England September 14, 1893, No. 17,308, and January 19, 1895, No. 1,193; in Germany December 15, 1893, No. 77,042; in Switzerland March 8, 1894, No. 8,450; in Austria March 8, 1894, No. 44/594; in Belgium March 10, 1894, No. 108,944; in Hungary March 11, 1894, No. 399; in Spain March 21, 1894, No. 15,615; in Italy April 24, 1894, XXVIII, 36,227, and in Portugal April 26, 1894, No. 1,913.

*To all whom it may concern:*

Be it known that I, JÜRGEN MÄHLMANN, forester, residing at 13 Kleine Gärtnerstrasse, Altona, in the German Empire, have invented  
5 new and useful Improvements in Cartridges for Signaling, (patented in Germany, No. 77,042, dated December 15, 1893; in Austria, No. 44/594, dated March 8, 1894; in Hun-  
10 gary, No. 399, dated March 11, 1894; in Belgium, No. 108,944, dated March 10, 1894; in Italy, XXVIII, 36,227, dated April 24, 1894; in Spain, No. 15,615, dated March 21, 1894; in Portugal, No. 1,913, dated April 26, 1894; in England, No. 17,308, dated September 14,  
15 1893, and No. 1,193, dated January 19, 1895, and in Switzerland, No. 8,450, dated March 8, 1894,) of which the following is a specification.

This invention relates to a cartridge of peculiar construction, by which light-signals may be given for great distances.

The accompanying drawings illustrate this invention as follows:

Figure 1 is a side view of the cartridge. Fig.  
25 2 is a back view of the same.

Contrary to the construction of ordinary cartridges, the paper or metal case of the cartridge of ordinary shape has an elongated opening *a* in the side, over which is a thin  
30 paper covering, and the ends have the ordinary wad and the percussion-cap therein. Owing to the weakness of the thin paper covering, the discharge takes place through the side opening *a* of the cartridge instead of, as

usual, through the front end, and thus throws 35 an extremely intense light directly upward, which is visible from a long distance. The length of the discharge from an instantaneous flash to one of several seconds' duration can be regulated by altering the proportion of the 40 ingredients. The charge consists of a mixture of one-third magnesium, one-third sulphide of antimony, and one-tenth chlorate of potassium. For colored signals instead of sulphide of antimony the mixture contains 45 sulphate of copper, nitrate of barium or nitrate of strontium.

The cartridge is fired by means of a pistol-like arrangement especially constructed for this purpose, the hammer of which ignites 50 the cartridge by means of the percussion-cap in the ordinary manner. The effect of the light is so great that it is noticed at a distance of twenty kilometers, and even farther.

Having now described my invention, what 55 I claim, and desire to secure by Letters Patent, is—

A cartridge for signaling, the case of which has an elongation in the side, over which a thin paper covering is arranged for the pur- 60 pose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JÜRGEN MAHLMANN.

Witnesses:

FRITZ AHRENS,  
PAUL MÜLLER.